REMARKS/ARGUMENTS

Claims 1-16 remain in this application.

1. Allowable Subject Matter

The Examiner is thanked for indicating that Claim 13 would be allowable if rewritten in independent form.

2. Claim Rejections Based Upon 35 U.S.C. § 103

Claims 1-8, 11, 12, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hart Jr. et al., (5,418,881) in view of Cocchini et al. (2004/0081412). The Patent Office asserts that Hart teaches an optical fiber (and corresponding method of manufacturing) having low PMD – e.g. less than 0.5 ps/km$^{1/2}$, which is achieved by impressing a spin on its longitudinal axis that is alternatively clockwise and counter-clockwise (e.g. Col 2, 11. 30-65), and that it is taught that beneficial results may be seen from varying the spatial spin frequency – thus there will be a minimum and maximum spin reversal distance (e.g., Col. 3, ll. 25-35), and that additionally, the spin repeat distance is taught to be at least 20 km (e.g. Claim 1). The Patent Office further states that Hart, however, does not explicitly teach that the fiber's beat length is greater than 0.5 meters, and that since it is known that beat lengths are typically in the range from 1m to 100m (as taught by Cocchini et al. (2004/0081412), e.g. paragraph 101), it would have been obvious to one of ordinary skill in the art at the time of the invention to choose a beat length ranging from 0.5 meters to greater than 10 meters in the invention of Hart. The Patent Office concludes that one would have been motivated to do so because it would allow optimization of the chosen function parameters.

Regarding Claims 4-8, and 16, the Patent Office asserts that while Hart teaches that the spin repeat distance may be at least 20 meters, Hart does not explicitly teach that the spin repeat distance may be between 50 and 200 meters, but that it would have been obvious to one of ordinary skill in the art at the time of the invention to select a spin repeat distance between 50 and 200 meters since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art, citing In re Boesch, 617 R. 2d, 205 USPQ (CCPA 1980).

Claims 1, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hart Jr. et al., (5,418,881) in view of Cocchini, and in further view of Conradi et al., (6,430,346). The Patent Office asserts that Hart in view of Cocchini teaches an optical fiber (and corresponding method of manufacturing) as discussed above, however, Hart in view of Cocchini does not explicitly teach the relative index of refraction of various core segments, but Conradi et al. (6,430,346) teaches a negative dispersion single mode waveguide fiber with a relative index of refraction profile of three consecutive core segments following 1>3>2. The Patent Office states that Conradi teaches that such core segment profiles are advantageous for negative PMD dispersion after a PMD induced by fiber amplification, referring to col. 7, ll. 37-65 and Fig. 2. The Patent Office concludes that it would have been obvious to one of ordinary

skill in the art at the time of the invention to employ a relative index of refraction profile of three consecutive core segments as taught by Conradi in the invention Hart in view of Cocchini because this would yield efficient negative PMD dispersion as taught by Conradi, and that one of ordinary skill in the art would have been motivated to do so because this would allow for PMD compensation after fiber amplification without inducing any further PMD.

The rejections are respectfully traversed.

First, Applicants note that Hart uses terminology that differs from the terminology found in the present Application.

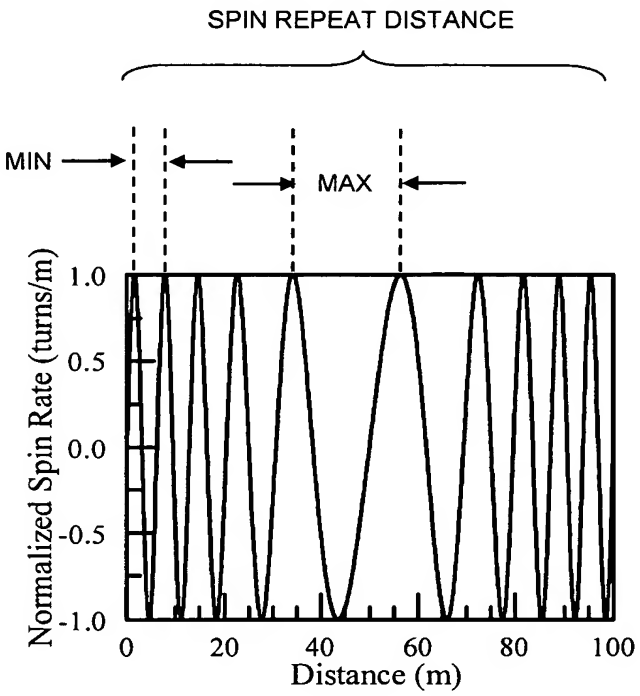
For example, Hart refers to "spin spatial frequency" or "spatial frequency", e.g. in Fig. 6 and col. 5 ll. 29-40, with units of spins per meter. In Fig. 6 of Hart, curve 60 has a spin imparted with a spatial frequency of about 21 spins per meter at a length (i.e. location) along the fiber of about 0.3 meters. The "pitch" at a length along the fiber of about 0.3 meters is about 1/21 meter (1 / spatial frequency). Curves 60 and 61 in Fig. 6 of Hart thus show non-constant spatial frequency over the length of the fiber, i.e. non-constant pitch spin is imposed over the length of the fiber and the spin has alternately positive and negative helicity. Curve 60 has non-constant spatial frequencies that vary between about +/- 28 spins/meter along the length of the fiber. Curve 61 has non-constant spatial frequencies that vary between about +/- 56 spins/meter along the length of the fiber. At col. 3 ll. 1-5, Hart states: "Thus, fiber according to the invention comprises a portion or portions having spin spatial frequency in excess of 4 spins/meter, preferably in excess of 10 or even 20 spins/meter." Such spin spatial frequencies correspond to pitch less than 1/10 meter or even less than 1/20 meter.

The "spin repeat distance" is not clearly defined in Hart. Other than in Claim 1, the only appearance of "spin repeat distance" in Hart occurs at col. 2 ll. 54-6: "Associated with such a frozen-in spin is a pitch, the spin repeat distance along the fiber." If "spin repeat distance" is taken to mean "pitch", then "spin repeat distance" would mean the distance required to complete one spin, which in the example above for a spatial frequency of about 21 spins per meter would be 1/21 meter, for instance. Claim 1 of Hart recites "... a spin repeat distance of *at most* 20 m" (emphasis added).

On the other hand, the present Application refers to "spin rate" with units of turns/meter (which are the same units as spins/meter), instead of Hart's "spin spatial frequency" or "spatial frequency".

Furthermore, the present Application refers to "spin reversal distance", which is the local peak to peak separation distance for the spin rate as a function of distance along the length of an optical fiber, as well as "spin repeat distance". See Paragraph 0046 of the present Application. FIG. 5 of the present Application (reproduced in the drawing below with additional marking) illustrates an embodiment having a minimum spin reversal distance, or minimum local peak to peak separation (labelled MIN in the drawing below), of about 6 m, and a maximum spin reversal distance, or maximum local peak to peak separation, (labelled MAX in the drawing below) of about 23 m. The spin repeat distance for the embodiment illustrated by FIG. 5 is about 100 m. In this embodiment, the peak magnitude shared by all of the local maxima and local

minima in the spin profile is 1 turns/meter. According to the present invention, a plurality of varying spin reversal distances occurs within the spin repeat distance, and both a minimum spin reversal distance and a maximum spin reversal distance are present.



Using the terminology of Hart for a moment, FIG. 5 of the present Application shows non-constant spatial frequencies that vary between about +/- 1.0 spins/meter, normalized, along the length of the fiber. However, while Hart discloses non-constant spatial frequencies (or non-constant pitch), for example shown in Hart's Fig. 6, Hart neither teaches nor suggests a plurality of varying spin reversal distances occurring within a spin repeat distance as required by the presently claimed invention. Curve 60 and Curve 61 of Hart each show only one entire spin reversal distance (i.e. no plurality of spin reversal distances is shown), and most importantly no plurality of *varying* spin reversal distances is taught or suggested.

Regarding the rejection of Claims 4-8, and 16, Applicants note that Hart teaches that its "spin repeat distance" is at *most* (not at least) 20 meters.

Applicants submit that there is no mention in Hart or Cocchini or Conradi of using a plurality of varying spin reversal distances.

The Patent Office notes that Chen et al. (2003/0152348) has a common assignee with the instant application and asserts that the reference reads on at least Claims 1 and 11 and constitutes prior art under 35 U.S.C. §102(e).

An Affidavit Disqualifying Commonly Owned Application as Prior Art is submitted herewith. Applicants submit that the rejection under 35 U.S.C. §102(e) is obviated and request withdrawal of the rejection.

Accordingly, Applicants submit that the claims are allowable over the cited references and request withdrawal of the rejections.

3. Conclusion

Based upon the above amendments, remarks, and papers of records, Applicants believe the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Applicants believe that no extension of time is necessary to make this Reply timely. Should Applicants be in error, Applicants respectfully request that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorize the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Joseph M. Homa at 607-974-9061.

Respectfully submitted,

DATE: 9/15/05

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